

Bank stabilization studied at Klondike Gold Rush

by Meg Hahr and Theresa Thibault

COPYRIGHT TEMSCO HELICOPTERS



A moraine in the Taiya River watershed in Klondike Gold Rush National Historical Park released 10 million cubic yards of debris in July 2002, suddenly filling a glacial lake. The resulting flood threatened visitors, historic structures, and park facilities in the gold rush town of Dyea.

SINCE ITS INCEPTION, KLONDIKE GOLD RUSH National Historical Park (Alaska) has been faced with a particularly complex natural resource management issue regarding important cultural resources and a highly dynamic river. Established in 1976 to preserve historic structures and trails associated with the Klondike Gold Rush of 1898, the park also contains significant natural resources including salmon, bald eagles, grizzly bears, glaciers, and a productive estuary. Another valued park resource is the Taiya River, a free-flowing, glacial meltwater river affected by coastal, stream, and tectonic processes. This extremely dynamic river drains approximately 188 square miles of glaciers and coniferous forest and is prone to spontaneous channel migrations and catastrophic flooding.

The river's unpredictable nature was highlighted on 23 July 2002, when a landslide of 10 million cubic yards of moraine material suddenly filled a glacial lake in a tributary drainage, generating a tremendous flood that swept through the park, threatening visitors, cultural resources, and park facilities. Over the last century, the Taiya River has wandered widely over its floodplain, causing the removal of more than 30% of the historic gold rush town of Dyea, part of a National Historic Landmark District. To date, a total of 345 archeological features have been found in Dyea along with an uncounted number of historic artifacts.

In its 1996 general management plan, the park resolved to evaluate the Taiya River erosion issue and find a way to prevent additional loss of cultural resources in the Dyea area. Although stream bank stabilization projects are permitted under *NPS Management Policies* for situations in which "there is no other feasible way to protect natural resources, park facilities, or historic structures," park resource managers were reluctant to pursue this alternative given the likelihood of impacts on natural resources. An impediment to effective management has been technical issues associated with interpreting historical hydrologic data from USGS gauging stations, aerial photos, and bank retreat monitoring efforts.

In 2002 the park received technical assistance from the NPS Water Resources Division and the Geologic Resources Division to evaluate the existing information and recommend a scientifically sound course of action. After two site visits, NPS Hydrologist Rick Inglis and Geo-

morphologist Hal Pranger concluded that the Taiya River would eventually migrate through and destroy the remaining portions of Dyea if the channel bank is not stabilized. Although protection of the bank is possible using conventional methods, the geoscientists recommended that the park consider engineered logjams, a new ecologically sensitive approach. In-stream structures of interlocking, native wood debris, engineered logjams are designed to imitate natural logjams and stream processes to achieve physical and ecological objectives including aquatic habitat restoration, flood control, and bank protection.

The park is exploring the feasibility of constructing engineered logjams to protect at-risk resources in the Taiya River floodplain. Information gained from the Water and Geologic Resources Divisions will likewise assist managers in locating potential sites for park facilities that may be developed in the future. Park resource managers are coordinating with other landowners along the river to meet human needs in the watershed without compromising the outstanding natural resources of the ever-changing Taiya River system. ■

meg_hahr@nps.gov

Natural Resource Program Manager, Klondike Gold Rush National Historical Park, Skagway, Alaska

theresa_thibault@nps.gov

Chief of Resources, Klondike Gold Rush National Historical Park, Skagway, Alaska



NPS PHOTO

The National Park Service has relocated the McDermott cabin, thought to be a toll station for gold rush stamperers crossing the Taiya River to reach the start of the Chilkoot Trail. The Park Service is also studying the possibility of an ecologically sound way to stabilize the riverbank to protect the park's cultural and natural resources.